

*The Highland Light
was relit in its new
location on
November 3, 1996.*



mains. The mains were equipped with a series of 60-ton hydraulic jacks installed in an inverted position.

The purpose of the main beams was to spread the load of the cross steel and allow for even jacking. The structure was initially lifted off its present foundation under the Unified Lifting System. The Unified Lifting System allows for pressure on the jacks to be placed evenly; thus, all points come up at the same time.

Once lifted, the lighthouse was placed on roll beams supported by wooden cribbing. The

hydraulic jacks installed in the mains were activated and cradled in roller dollies which allow for movement on the roll beams. At this point, the hydraulics were arranged for three zone travel, allowing for compensation between the zones should unanticipated settlement occur.

Movement was accomplished when hydraulic rams, interconnected between the roll beams and the main beams were activated, pushing the hydraulically suspended lighthouse on roller dollies down the roll steel.

Unique to this relocation project was an ingenious method of lowering the structure evenly to account for a 10' drop in grade. A secondary set of jacks was installed in the main beams, which were activated in unison and suspended the building while roll beams were lowered to compensate for grade. The building was then lowered in increments, and placed upon the newly set roll beams.

The relocation was accomplished during the latter half of July 1996 and the beginning of August 1996.

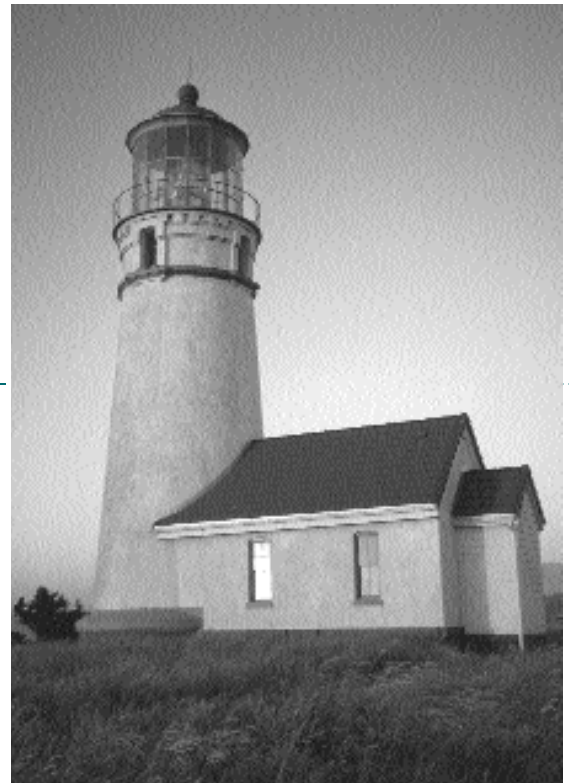
Joseph J. Jakubik is Project Manager for International Chimney Corporation. Photos courtesy International Chimney Corporation

David Pinyerd

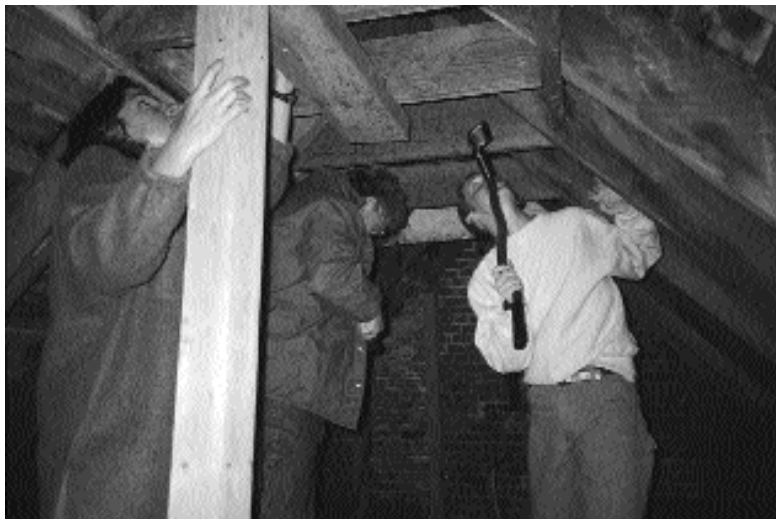
Preservation Education at the Cape Blanco Lighthouse

*Cape Blanco
Lighthouse (1870)
with altered work-
room roof and
enclosed entry
vestibule.*

The Cape Blanco Lighthouse comes with several superlatives: it's the highest lighthouse in Oregon at 256' above sea level; it's the westernmost lighthouse on the mainland in the lower 48 states; it's the oldest operating lighthouse in Oregon (1870); and it had the longest serving lighthouse keeper on the Pacific Coast, James Langlois, who was stationed at Cape Blanco for 42 years. As with all lighthouses open to the public, its current operation is a joint effort. Through a cooperative agreement, the Coast Guard operates the light and owns the land on which it sits, the Bureau of Land Management (BLM) interprets the site and maintains the lighthouse and grounds, Oregon State Parks manages the 1,895-acre park that buffers the lighthouse property and



coordinates the docents that interpret the lighthouse, and the Friends of Cape Blanco provide docents and help fund lighthouse projects. And to add to the mix, this past summer, the University of Oregon became involved with the lighthouse.



Rebecca Gershow, Art Corliss, and Justin Gray inspect the modifications made to the workroom roof structure.

As part of the second annual University of Oregon Historic Preservation Field School, students became familiar with the lighthouse by performing a condition assessment on the structure. Lighthouses are ideal vehicles for preservation education because of their relatively open structure and use of a variety of materials and structural systems. They suffer from accelerated deterioration problems, making excellent weather laboratories for students. And, finally, they are simply captivating structures on the natural landscape.

The BLM and Oregon State Parks contracted with the University of Oregon Historic Preservation program to provide a professional condition assessment report on the lighthouse during our summer field school. Lisa Sasser, then Assistant Chief Historical Architect with the

National Park Service, Washington, DC, volunteered to lead the assessment. Along with her extensive experience in building assessment, Lisa brought several lighthouse assessment reports completed by the staff of the NPS Williamsport Preservation Training Center (WPTC). Using these assessments as models, Lisa led us through a full condition assessment of the Cape Blanco Lighthouse.

We started the assessment with an orientation by Stephen

Samuels of the Coos Bay BLM. He gave us a complete history of the Cape Blanco headland from 7000 B.P. up through the present. The site saw its first human litter in the form of discarded shells, the beginnings of an enormous midden that covers a good portion of the headland up to 7' deep in spots. The site is one of the oldest on the Oregon Coast primarily because it is a headland and not subject to the rapid erosion experienced by the rest of the coastline. The name Cape Blanco was attached in 1603 by Spanish explorer Martin d'Anguilar. Shipping traffic was light along the Southern Oregon Coast until 1853 when gold was discovered on the beaches just south of Cape Blanco. By the mid-1860s, after many shipwrecks at the headland, the federal government started appropriations for a light at Cape Blanco.

In 1867, the Lighthouse Board purchased 48 acres comprising most of the headland with the intent of constructing a lighthouse to serve the growing coastal traffic. In 1868, Col. Robert Williamson arrived to supervise the clearing of the heavily wooded headland and the production of bricks for the lighthouse. Two hundred thousand bricks were fired locally for the tower and keeper's residence. The original design height for the lighthouse was 18'; however, it was positioned so far back from the edge of the headland it had to be increased to 50'. Attached to the tower was a combination workroom and oil room. Sitting 206' above the ocean, its fixed first-order Fresnel lens could be seen for 22 miles when lit on December 20, 1870.

The lens was replaced in 1936 with an electrified, revolving second order lens. World War II turned the lighthouse site into a massive Loran Station. As with many Coast Guard facilities, buildings were razed when they became surplus. The keepers' dwellings were demolished in the 1960s. In fact, most of the historic structures have disappeared from the site and all that remains is the lighthouse and attached workroom, miscellaneous antennas, several modern garages, a modern duplex, and ubiquitous underground tanks. The lighthouse became fully automated in 1980. With a less active role at the site, the Coast Guard in 1994 granted an interagency permit to the BLM to interpret the site for the public.

Once the field school participants had a handle on the history, we divided into three teams of four participants each and proceeded to evaluate the condition of the structure from stem to stern, finial to foundation. Each team worked the entire structure so that when we were finished, we had three different takes on each element of the lighthouse. We used Architectural Assessment Feature Inventory Data forms provided by the NPS on which to take notes. This forced each group to



Art Corliss and Marilou Aquino preparing to use the borescope on an air intake vent.



Art Corliss using a velocimeter to measure the draft through an air intake vent.

break up the structure into a series of features (e.g., air intake vents at the watch room level), so that all the groups worked within the same parameters and definitions. In addition to the standard tools such as flashlights, clipboards, and our eyes, we used a borescope and a velocimeter to evaluate the structure. The borescope allowed us to peer through cracks to look at such features as the arched structural members within the canopy. The velocimeter showed us the

speed at which air flowed through certain areas of the structure.

The students found that the main problem at Cape Blanco, as with many lighthouses, is moisture. Lighthouses were built to breathe, using a draft to provide air to and exhaust smoke from the open flame in the lantern. Any interior moisture would be mopped up daily by the keeper on duty. Today, electrification and threats of vandalism have turned many lighthouses into terrariums, sealed tight with no air flow. This is the case at Cape Blanco.

In the past, the keepers would constantly adjust the draft through a series of louvers on six vents encircling the tower. This provided air for the flame and kept condensation to a minimum. Smoke would then exhaust out the ball finial. Today, constant monitoring is impossible and some of the vents are inoperable. Since condensation was accumulating so rapidly, there was a fear that water was being trapped behind the interior plaster work. So, several years ago the Coast Guard sand-blasted the entire interior, removing both the plaster and the baked "skin" of the bricks. This has created a serious problem in which waterborne salts migrate through the brick to the interior surface and are deposited in the form of a white powder, i.e., efflorescence. These salt crystals in the surface pores lead to the crumbling of the soft brick surface. With a plaster coat, the salts migrate to the surface of the plaster instead of the brick where they can be harmlessly brushed off. Since re-plastering is cost prohibitive, we suggested increasing the tower's ventilation to decrease the moisture level and thereby decrease the rate of efflorescence. One approach is to turn

the lighthouse into a giant chimney by replacing the two modern interior doors with heavy mesh doors (allowing only air passage) and then opening up the floor hatch to the crawl space to allow the foundation vents to help vent the entire structure out the ball finial. This suggestion will be tried during 1997.

As with any structure of its age, we were surprised by some of its modifications and accretions. For example, there used to be a decorative king post element in the gable over the entry appropriate to its 1870 construction. We found the king post's tie-beam recycled as a rafter in the work-room roof, complete with mortise and chamfered edges.

Since we were under a time constraint (this evaluation was just one project of three during the final two-week session), we used several time-saving technologies. We used a digital camera to take photos of problem areas on the lighthouse. We then took the camera back to our home base, downloaded the images into our word processor, and attached labels and captions. We also scanned drawings into the assessment document so as to eliminate any need for last-minute paste-ups when it came time to print the document. Being students used to extremely tight deadlines, it made us all laugh when Steve Samuels of BLM asked if we might have the document ready for him within two months—we had it ready for him in four days: two days in the field and two days to produce the assessment report.

This winter term, architecture and historic preservation students at the University of Oregon are participating in a studio to design a new visitor's center for the lighthouse. The project is once again being led by the Bureau of Land Management. The education continues at the Cape Blanco Lighthouse.

References

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David Pinyerd coordinated the last two University of Oregon preservation field schools. He is currently working on his thesis concerning the preservation of Life-Saving Service and Coast Guard architecture in the Pacific Northwest.

Photos by the author.